AMENDMENTS TO THE CLAIMS

1. **(Original)** A gate for quantum information processing comprising:

at least two units each having a plurality of states useable for representing quantum information; and

an electron system having at least a first state and a second state, which states provide different amounts of interaction between said units, wherein the electron system is switchable by means of electromagnetic radiation between the first and second states to control the interaction between the units.

2. **(Original)** A gate according to claim 1, wherein the information-representing units are systems having nuclear spin or electronic spin or are reorientable defects.

3. **(Previously Presented)** A gate according to claim 1, wherein the first and second states are the ground state and an excited state of the electron system.

4. **(Previously Presented)** A gate according to claim 1, wherein the second state has a larger spatial extent than the first state.

5. **(Previously Presented)** A gate according to claim 1, wherein when the electron system is in the first state the interaction between the units is substantially eliminated and when in the second state the interaction is enhanced.

6. **(Previously Presented)** A gate according to claim 1, wherein the electron system comprises one or more electrons provided by at least one donor atom.

7. **(Original)** A gate according to claim 6, wherein the at least one donor atom comprises a deep-donor.

8. **(Previously Presented)** A gate according to claim 1, wherein the electron system comprises one or more holes resulting from at least one acceptor atom receiving an electron.

9. **(Original)** A gate according to claim 8, wherein the at least one acceptor atom comprises a deep-acceptor.

10. **(Previously Presented)** A gate according to claim 1, wherein the or each donor or acceptor atom is located between the information-representing units.

11. **(Previously Presented)** A gate according to claim 1, wherein the or each donor or acceptor atom is separated from the information-representing units by an interface.

12. **(Previously Presented)** A gate according to claim 1, wherein the information-representing units comprise donor atoms, of which the nuclear spin states are useable for representing quantum information, and the electron system comprises one or more electrons from said donor atoms.

13. **(Previously Presented)** A gate according to claim 1, wherein the information-representing units comprise acceptor atoms, of which the nuclear spin states are useable for representing quantum information, and the electron system comprises one or more holes provided by said acceptor atoms.

14. **(Previously Presented)** A gate according to claim 1, wherein the energy difference between the first and second states is greater than the energy associated with the information of the information-representing units.

15. **(Previously Presented)** A gate according to claim 1, wherein the energy difference between the first and second states is greater than 0.025 eV.

16. **(Previously Presented)** A gate according to claim 1, wherein the gate is provided in a nanocrystal.

17. **(Previously Presented)** A gate according to claim 1, wherein the information-representing units are provided in an Si channel in an SiO_2 matrix.

18. **(Previously Presented)** A gate according to claim 1, wherein the electromagnetic radiation is time dependent, preferably a laser pulse.

19-28. **(Cancelled)**

29. **(New)** A gate according to claim 1, wherein said first and second states of said electron system are energy states and said first and second energy states of said electron system are deeper than corresponding first and second energy states of said at least two units.